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A PRELIMINARY STUDY OF HAWAIIAN SPECIES OF THE GENUS RAUVOLFIA

ADDITIONS TO THE GENERA SCALESIA AND HIDALGOA

BY

EARL EDWARD SHERFF

RESEARCH ASSOCIATE, SYSTEMATIC BOTANY

BOTANICAL SERIES

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A PRELIMINARY STUDY OF THE HAWAIIAN SPECIES OF THE GENUS RAUVOLFIA[1] [PLUM.] L.

(FAMILY APOCYNACEAE)

EARL EDWARD SHERFF

For many years, specimens of *Rauvolfia* collected in the Hawaiian Islands have been indiscriminately referred to *R. sandwicensis* A. DC., a species published by Alphonse DeCandolle (Prodr. 8: 339. 1844) from a Hawaiian plant of unspecified habitat and with all too scanty a description. On careful examination, these specimens are found to represent seven rather easily distinguishable species, six of them new to science. Perhaps the chief obstacle to a taxonomic study of the Hawaiian species has been the inadequacy of DeCandolle's original description of his *R. sandwicensis*, coupled with the comparative inaccessibility of the lone type specimen in the herbarium representing the DeCandolles' Prodromus. It was difficult to ascertain just which was the real *R. sandwicensis* of Alphonse DeCandolle, and thus which six other species were actually new. Recently, however, the authorities at the Museum of Natural History in Paris and the Prodromus Herbarium in Geneva have cooperated most generously in helping to settle the exact identity of the original Gaudichaud plant used by DeCandolle as his type. At Paris, M.

[1] *Rauvolfia* is the spelling given throughout his text by Plumier (Nov. Pl. Amer. Gen. p. 19, *tab.* 40. 1703) and reinforced with his Latinized spelling, *Leonardus Rauvolfius*, of Leonhart Rauwolf's name. *Rauvolfia* was accepted by Linnaeus and so appears in his Gen. Pl. ed. 5: 98 (gen. no. 59). 1754 *et op. cit.* ed. 6: 115 (gen. no. 293). 1764 and in his Sp. Pl. ed. 2 (the genus was omitted in ed. 1), p. 303. 1762. Alphonse De Candolle (Prodr. 8: 336. 1844) called *Rauvolfia* an error and spelled the name *Rauwolfia*. In this he has been followed by numerous authors. The spelling *Rauvolfia* must be retained, however, according to our present International Rules of Botanical Nomenclature (Jena. 1935); *cf.* arts. 20 and 70. In the latter article, under "examples of retention of original spelling," comparable examples are given, such as *Valantia* L. (not *Vaillantia*) and *Clutia* L. (not *Cluytia*).

In this connection it may be observed that Woodson (Ann. Missouri Bot. Gard. 17: 10. 1930) has erected the new tribe Rauwolfieae (*sic*) under the subfamily Plumeroideae of the family Apocynaceae. Since the International Rules (Jena. 1935) advise (Recom. 42) that "new epithets should be written in conformity with the original spelling of the words from which they are derived . . . ," and since they require the spelling *Rauvolfia* for the generic name, Woodson's spelling is here construed as an "unintentional orthographic error" (art. 70) and altered to *Rauvolfieae*.

Leandri, Vice-Director of the Laboratory of Phanerogamy, instituted a detailed search but found no plant of Gaudichaud's type-collection.[1] At Geneva, Dr. Charles Baehni made a careful examination of DeCandolle's type, a fruiting specimen entirely without flowers, and supplied me with an excellent photograph of it. He accompanied the latter with sketches of the calyces and fruits, also with certain precise measurements drawn from the type. Because of Dr. Baehni's invaluable assistance, it was possible to identify the DeCandolle type positively with several suites of specimens collected in recent years on the Island of Oahu (*Degener* 9794; *Degener* 9801; *Degener* 17197; *Degener* 17651; *Degener & Bush* 5625; *Degener & Shear* 3250; *Degener et al.* 3710; *Fosberg & Duker* 9213; *Topping & Bush* 9804) and on the Island of Maui (*Degener* 17596; *Forbes* 475-*M;* *Forbes* 2280-*M*, etc.).

Some years ago, Mr. Otto Degener gave special attention to this genus in the Hawaiian Islands when collecting specimens preparatory to writing his Flora Hawaiiensis. Recently he has most generously turned his *Rauvolfia* collections, notes, and drawings over to me in their entirety. With these to supplement the herbarium specimens available elsewhere, the following somewhat tentative or preliminary key and detailed treatments have been produced:

a. Leaves mostly narrow-oblong to elliptic-oblanceolate or -obovate.

b. Principal leaves mostly under 3 cm. broad and tapering or subacuminate at each end, corolla under 7 mm. long; pedicels scarcely exserted; native of southern Oahu . . . 5. *R. Forbesii.*

b. Principal leaves mostly narrow-oblong and under 3 cm. broad, at apex obtuse or obtusish (flowers unknown); native of East Maui . . . . . 7. *R. mauiensis.*

b. Principal leaves broader, tapering or subacuminate at each end, at times 4 cm. broad, corolla reaching 10–11 mm.; pedicels exserted and obvious; native of southern Kauai . 6. *R. Helleri.*

a. Leaves mostly broader and obtuse to acute at each end, or in *R. sandwicensis* var. *subacuminata* subacuminate at distal end, blade seldom or but slightly broadening above middle.

b. Calyx 5–7 mm. long; native of Oahu and Lanai. 1. *R. Degeneri.*

b. Calyx commonly under 3 mm. long.

[1] He did, however, locate an assortment of more recently collected Hawaiian specimens of *Rauvolfia* and very kindly lent them to me for examination.

c. Inflorescence open, pedicels slender and obvious (about 2 mm. long), leaves acute at both ends; native of Hawaii.
4. *R. remotiflora.*

c. Inflorescence congested, pedicels stoutish and short or inconspicuous; leaves subacute to obtuse or at apex even rounded.

d. Corollas (if fully developed) very slender, up to about 1 cm. long; calyx about 1.5 mm. long; native of Molokai and Lanai.....3. *R. molokaiensis* vars. *typica* and *parvifolia.*

d. Corollas (if fully developed) swollen above, shorter; calyx commonly 1.5–3 mm. long or even longer.

e. Leaves obtuse to acute at apex; native of Oahu.
2. *R. sandwicensis* var. *typica.*

e. Leaves mostly subacuminate at apex; native of Kauai.
2β. *R. sandwicensis* var. *subacuminata.*

1. **Rauvolfia Degeneri** sp. nov. Plate 1.

Frutex vel arbuscula, glabra, 3–6 m. alta; ramis brevibus, rigidis, albidis, striatis. Folia verticillata, plerumque 5 ad nodum, petiolata; petiolo tenui, 1.5–3 cm. longo, axilla 5–12 glandulos (stipitatos forsitan lineares) subtendente; lamina utrinque obtusa vel acuta vel raro subacuminata, moderate ad late elliptico-oblonga vel elliptico-obovata, 7.5–13 cm. longa et 2.5–5 cm. lata, pallida, membranacea, venis lateralibus parallelis subobscuris in lineam submarginalem confluentibus. Flores fragrantes (fide Fosbergii), in 3 vel 4 cymis (his umbellate decompositis) congesti, inflorescentia petiolos subaequante vel etiam superante, primum terminali mox axillari; pedunculo 1–3.5 cm. longo, angulari; pedicellis 0.5–2 mm. longis; bracteis ovatis ad lanceolatis, acutis, plerumque 1.5–3 mm. longis, in axillis glandulos stipitatos subtendentibus. Calyx viridis, glaber, 5-partitus fere usque ad basim, 5–7 mm. longus; sepalis 3–5 mm. latis, imbricatis, obtusis ad abrupte acutis vel acuminatis. Corolla nunc minima vel abortiva, stylo longe exserto; nunc amplior, limbo albo, lobis 2–3 mm. longis et 3–4 mm. latis, marginibus irregularibus basi plus minusve constrictis, circumambitu diverse ovatis ad obovatis obcordatisve, tubo 10 mm. longo et 1–1.5 mm. crasso extus glabro intus (supra medium) sparsim pubescenti apice dilatato, gutture vix constricto, stylo filiformi incluso corollae tubum aequante, stigmate complanato-prismatico circ. 0.6 mm. longo et annulo angusto piloso subtento.

Shrub or small tree, glabrous, 3–6 meters tall; branches short, stiff, whitish, striate. Leaves verticillate mostly in fives, petiolate, petiole slender and 1.5–3 cm. long, with 5–12 stipitate perhaps linear glands in the axil; blade obtuse to acute or rarely subacuminate at each end, moderately to broadly elliptic-oblong or -obovate, 7.5–13 cm. long and 2.5–5 cm. wide, pale, thin-chartaceous, the faint parallel lateral veins confluent into a submarginal line. Florets fragrant (according to Fosberg), crowded into 3 or 4 umbellately decompound cymes, these subequal to or even exceeding the petioles, at first terminal but soon axillary (through innovations from tip of branchlet); the common peduncle 1–3.5 cm. long, angular, pedicels 0.5–2 mm. long, the acute, lanceolate to ovate bracts mostly 1.5–3 mm. long and with stipitate glands in their axils. Calyx green, glabrous, 5-parted to near base, 5–7 mm. long, sepals 3–5 mm. wide, imbricated, obtuse to abruptly acute or acuminate. Corolla in many flowers diminutive or abortive, their style long-exserted, in some or many flowers fully developed and then: limb white; its 5 lobes 2–3 mm. long and 3–4 mm. broad, irregular at edges, more or less constricted at base, in outline variously ovate to obovate or obcordate; tube 8–10 mm. long and 1–1.5 mm. thick, glabrous outside and sparsely pubescent inside above middle, dilated for ±1.5 mm. below the scarcely constricted throat; style filiform, included, as long as corolla-tube, the flattish-prismatic stigma about 0.6 mm. long and subtended by a narrow hairy ring.

Specimens examined:

Island of Oahu: *Chamisso*, Isl. Oahu (type, Chi.: isotype, Len.); *Erling Christophersen* 3716, alt. 450 meters, ridge between valleys 10 and 11, below Kanehoa, central Lualualei, Waianae Mountains, June 29, 1932 (N.Y.); *Otto Degener* 9798, in moderately dry ravine, Honolulu side of Palikea, Waianae Range, October 23, 1932 (N.Y.); *Degener* 9800, in dry, grassy region, west side of Pohakea Pass, July 30, 1932 (N.Y.); *Degener* 17200, in open forest, middle ridge east of Puu Kanehoa, May 1, 1940 (N.Y.); *Degener* 17748, in forest, short spur just east of Puu Hapapa summit, June 20, 1939 (N.Y.); *Degener, K. K. Park, Y. Nitta, & Will Bush* 9799, gulch north of middle ridge between Puu Kamaohanui and Puu Pane, Waianae Range, June 11, 1932 (N.Y.); *F. R. Fosberg* 13313, shrubby tree 4 meters tall, lactiferous, flowers white with greenish corolla-tube, fragrant, rock ledges on cliff, alt. 200 meters, Kealia trail up cliff, Waianae Mountains, November 8, 1936 (Chi.); *Fosberg* 14118, shrub 4 meters tall, flowers white and fragrant, in moist forest, alt. 400

RAUVOLFIA DEGENERI

From specimen collected on Honolulu side of Waianae Range, near Pohakea Pass, Island of Oahu; flowering branch × 0.42; flower, both views, × 3.36; fruit, × 0.84.

meters, Woodlawn, Manoa, Honolulu, June 19, 1937 (Chi.); *Horace Mann, Jr., & William T. Brigham* 113, Oahu (Chi., 2 sheets, one with label giving the definite locality, Konahuanui; Gray, 2 sheets; N.Y.).

Island of Lanai: *Mann & Brigham* (similarly) 113, Lanai (Chi.).

This species is one of which Degener has distributed various specimens determined as *Rauvolfia sandwicensis* A. DC. It is a pleasure to commemorate here his indefatigable zeal in the collection and scientific study of Hawaiian plants by naming this species in his honor.

Besides the above-cited specimens, I have seen two fragments at Gray Herbarium, from the Hawaiian Islands. One was collected by George Barclay, the other by the United States South Pacific Exploring Expedition under Captain Wilkes. Both are instantly recognizable from the large calyces.

2. **Rauvolfia sandwicensis** A. DC. Prodr. 8: 339. 1844 and var. **typica** var. nov.

Foliis habituque *R. Degeneri* valde similis, tamen floribus differt: calice plerumque 1.5–3 (raro –4) mm. longo; lobis apice nunc subacutis nunc obtusis vel rotundato-subtruncatis basi interdum late cordato-auriculatis; corolla etiam si plene extensa breviore (tubo 3–4 vel raro 5–6 mm. longo limbo guttureque tumidioribus et cunctis 3–4 mm. longis) et stylum includente, si abortiva stylo longe (±7 mm.) exserto multum superata, stigmate circ. 0.4 mm. stylo longe (±7 mm.) exserto multum superata, stigmate circ. 0.4 mm. longo.

Strongly similar in foliage and habit to *R. Degeneri* but differing in its flowers. Calyx commonly 1.5–3 (rarely –4) mm. long; lobes apically now subacute now obtuse or rotundate-subtruncate, basally at times broadly cordate-auriculate. Corolla even when well developed shorter (its tube 3–4 or rarely 5–6 mm. long, limb and throat more swollen and together 3–4 mm. long) and including the style; if abortive much surpassed by the much exserted (±7 mm.) style, stigma about 0.4 mm. long.

Specimens examined:

Oahu: *Otto Degener* 9794, on open, grassy slope, Paumalu Ridge, Koolau Range, October 18, 1931 (N.Y.); *Degener* 9801, in grass- and *Gleichenia*-covered foothills, directly *mauka* [*i.e.*, inland or toward the mountains] of Kawela Bay, Koolau Range, March 30, 1933 (N.Y.); *Degener* 17197, in lower forest, Oio, Paumalu Trail, June 16,

1940 (N.Y.); *Degener* 17651, Oahu, September 14, 1938 (type, N.Y.); *Degener & Will Bush* 5625, Kawaihapai, January 27, 1927 (N.Y.); *Degener & C. L. Shear* 3250, in open rain-forest near Kahuku side, along Pupukea-Kahuku trail, February 15, 1928 (N.Y.); *Degener, Hamilton Rodrigues, & Noel Krauss* 3710, a few small trees on dry, grassy slope, west side of Kahana Valley, February 24, 1929 (N.Y.); *F. R. Fosberg & Katherine Duker* 9213, tree 10 meters tall, in wet forest, alt. 480 meters, Pupukea-Kahuku Trail, Kaunala, Koolau Mountains, February 19, 1933 (Chi.); *ex herb J. F. Rock*, Tantalus, November 30, 1912 (Gray); *D. LeRoy Topping & Will Bush* (*Degener distrib. no.*) 9804, Manakuli, June, 1933 (N.Y.).

West Maui: *Otto Degener* 17596, near stream, Olowalu Valley, August 28, 1939 (N.Y.); *Charles Noyes Forbes* 475-*M*, Honokahau Drainage Basin, September 25–October 17, 1917 (N.Y.); *Forbes* 2280-*M*, Olowalu Valley, May 9, 1920 (N.Y.).

2β. **Rauvolfia sandwicensis** var. **subacuminata** var. nov.

Folia saepe 5–6 cm. lata, apice subacuminata.

Leaves often 5–6 cm. wide, at apex subacuminate.

Specimens examined: *Otto Degener & Henry Wiebke* 3249, in light woods on mountain, northeast of Kipu, Isl. Kauai, June 17, 1926 (N.Y.; without flowers or fruits); *Jules Remy* 368, Isl. Kauai, 1851–1855 (2 type sheets, Par.: isotype, Gray).

3. **Rauvolfia molokaiensis** sp. nov. and var. **typica** var. nov.

Foliis habituque *R. Degeneri* valde similis; petiolis foliorum usque ad 3.5 cm. longis lamina saepe 10–13 cm. longa et 3.5–5 cm. lata; pedunculo 3–5.5 cm. longo; floribus numerosis; bracteis lanceolato-ovatis, acutis; pedicellis ad anthesin sub 1 mm. longis demum usque ad 4 mm. longis; calice circ. 1.5 mm. longo, sepalis lato-ovatis, basi saepe cordato-auriculatis, marginibus crispis irregularibusque; corolla nunc tenuissima, usque ad circ. 1 cm. longa, limbo circ. 5 mm. lato, stylo incluso, nunc brevi abortivave stylo longe exserto; fructibus immaturis visis.

Very similar in foliage and habit to *R. Degeneri*. Petioles up to 3.5 cm. long, blade often 10–13 cm. long and 3.5–5 cm. wide. Peduncle 3–5.5 cm. long; flowers numerous; bracts lanceolate-ovate, acute; pedicels under 1 mm. long at anthesis, finally up to 4 mm. long. Calyx about 1.5 mm. long; sepals widely ovate, at base often cordate-auriculate, at margins crisped and irregular. Corolla now very slender, up to about 1 cm. long, its limb about 5 mm. across

and its style included, now short or abortive and with a much exserted style. Immature fruits seen.

Specimens examined: Island of Molokai: *Otto Degener & Kazuto Nitta* 9795, Wailau Valley, August 12, 1928 (Chi.; N.Y.); *Abbé Urbain Faurie* 453, Wailau, June, 1910 (Par.); *Charles Noyes Forbes* 23-*Mo*, Settlement Trail, June, 1912 (type, N.Y.).

Island of Lanai: *Forbes* 157-*L*, tree 30 feet tall, dry forests, west end of island, June 9, 1913 (N.Y.); *Mann & Brigham* 336 (Gray); *J. F. Rock* 8033, Mahana, July 24, 1910 (Gray; N.Y.; Par.).

3β. **Rauvolfia molokaiensis** var. **parvifolia** Degener & Sherff var. nov.

Folia minora lamina plerumque sub 10 cm. longa et sub 3 cm. lata.

Leaves smaller, blade commonly under 10 cm. long and under 3 cm. wide.

Specimens examined: *Otto Degener & Henry Wiebke* 3248, about 30 feet tall, hot arid rocky slope, ravine northwest of Puu Makuliilii (where precipice makes further descent impossible), Isl. Molokai, May 22, 1928 (type, N.Y.: isotypes, Chi.; N.Y.).

4. **Rauvolfia remotiflora** Degener & Sherff sp. nov.

Arbor glabra, ramis flavidis, internodiis brevissimis. Folia verticillata, 4 vel 5 ad unicum nodum, pallida, petiolo tenui 2–3 cm. longo; lamina pallida, membranacea, elliptico-oblonga, utrinque acuta, plerumque sub 10 cm. longa et sub 3.5 cm. lata, venis lateralibus parallelis in venam longitudinalem submarginalem confluentibus. Habitu inflorescentiae *R. Degeneri* similis sed multo minus congesta. Pedunculus circ. 2–3 cm. longus. Flores subnumerosi sed distantes. Bracteae ovatae vel late lanceolatae, acutae, margine irregulares, axillis nonnullos glandulos subtendentes. Pedicellus manifestus tenuis, circ. 2 mm. longus. Calyx sub 2 mm. longus, infra medium gamosepalus; sepalis nunc ovatis nunc rotundato-cordatis basi saepe auriculatis, apice nunc acutis nunc rotundis, marginibus eroso-denticulatis. Corolla ad anthesin circ. 9 mm. longa, tubo inferne 1 mm. crasso superne lobos versus abrupte dilatato et dimidio crassiore, limbo expanso circ. 5 mm. lato; stylo incluso. Fructus nitidus, circ. 2 cm. latus et ±1.2 cm. altus.

A glabrous tree, branches yellowish, internodes very short. Leaves whorled, 4 or 5 at a single node, pale, the slender petiole 2–3 cm. long; blade pallid, membranaceous, elliptic-oblong, acute

at both ends, commonly under 10 cm. long and under 3.5 cm. wide, the parallel lateral veins confluent into a lengthwise submarginal vein. Similar in habit of inflorescence to *R. Degeneri* but florets much less crowded. Peduncle about 2–3 cm. long. Flowers subnumerous but standing apart. Bracts ovate or widely lanceolate, acute, irregular at the margin, the axils subtending some glands. Pedicel conspicuous, slender, about 2 mm. long. Calyx under 2 mm. long, gamosepalous below its middle; sepals now ovate now rounded-cordate, at base often auriculate, at apex now acute now rounded, the margins erose-denticulate. Corolla about 9 mm. long at anthesis, its tube 1 mm. thick below but abruptly dilated above toward the lobes and a half thicker, the expanded limb about 5 mm. across; style included. Fruit shining, about 2 cm. wide and ±1.2 cm. tall.

Specimens examined: *L. W. Bryan* (*distrib. Otto Degener* no.) 9803, trees forming "quite a grove" *makai*[1] of Waiohinu in Kau, Isl. Hawaii, March, 1933 (N.Y.); *Otto Degener* 5624, in tree-covered, dry *aa kipuka*,[2] half-way between Kaalualu and Waiohinu, Isl. Hawaii, September 7, 1929 (type, N.Y.: isotype, N.Y.).

5. **Rauvolfia Forbesii** sp. nov.

Glabra, sine dubio arborescens. Folia verticillata, petiolo angusto 1.5–3 cm. longo, cum multis glandulis linearibus stipitatisque in axillis; lamina anguste elliptico-oblonga vel -oblanceolata, utrinque plus minusve acuminata, 6–11 cm. longa et 2–3 cm. lata, venis lateralibus in lineam submarginalem confluentibus. Flores numerosissimi, minimi, in 3 vel 4 cymis (his umbellate decompositis, tenuiter pedunculatis pedunculo 1–3.4 cm. longo) dispositi, bracteis ovatis vel lanceolato-deltoideis apice plerumque acribus vel etiam subulatis, 1.5–2.5 mm. longis. Calyx sub 2 mm. longus, sepalis basim versus connatis, margine irregularibus, apice obtusis acutis acuminatisve, lamina saepe cordata et basaliter obtuso-auriculata. Corolla sub 7 mm. longa et sub 1 mm. crassa; stylo incluso vel interdum corolla abortiva longe exserto. Fructus ignotus.

Doubtless arborescent. Leaves whorled; petiole narrow, 1.5–3 cm. long, many linear, stipitate glands in the axil; blade narrowly elliptic-oblong or -oblanceolate, at both ends more or less acuminate, 6–11 cm. long and 2–3 cm. wide, the lateral veins confluent into a submarginal line. Florets very numerous, very small, disposed in

[1] *At or towards the sea from.*

[2] *Aa*, a certain rough, broken form of lava; *kipuka*, a fertile, open place in a forest or on a lava-flow.

3 or 4 cymes (these umbellately decompound, slenderly pedunculate with a peduncle 1–3.4 cm. long) at end of a branchlet; bracts ovate or lanceolate-deltoid, at apex commonly sharp or even subulate, 1.5–2.5 mm. long. Calyx under 2 mm. long; sepals connate toward base, irregular at margin, obtuse or acute or acuminate at apex, often cordate and basally obtuse-auriculate. Corolla under 7 mm. long and under 1 mm. thick, lobes about 1–1.2 mm. long; style included or at times (from an abortive corolla) long-exserted. Fruit unknown.

Specimens examined: *Charles Noyes Forbes* 1429-*O*, west side of Nuuanu Valley, Isl. Oahu, January 7, 1910 (type, Chi.: isotype, N.Y.).

The tiny florets are especially numerous, a single peduncle at times supporting 50–100 or more. The leaves are distinctly narrower and sharper at both ends than in *R. sandwicensis* and *R. Degeneri*. Hillebrand (Fl. Haw. Isls. 295. 1888) cited "the west side of Nuuanu!" for his first locality for *R. sandwicensis* DC. and doubtless molded his detailed description of that species partly on the present Nuuanu species.[1]

6. **Rauvolfia Helleri** sp. nov.

Arbor parva, glabra, cortice laevi flavidoque, ramis rigidis patentibusque. Habitu *R. Forbesii* similis. Folia verticillata, petiolata petiolis angustis 1.5–3 cm. longis; lamina elliptico-oblonga vel anguste oblongo-obovata, utrinque acuminata vel acuta, 7–11 cm. longa et 2–4 cm. lata. Inflorescentia primum terminalis demum lateralis, pedunculis angulatis tenuibus 1–3 vel etiam –6 cm. longis, multifloris. Bracteae ovato-triangulatae vel lanceolatae sed apice plerumque acriter et plus minusve abrupte acuminatae, plerumque 1–2 mm. longae. Calyx 2–3 mm. longus, manifeste et saepe tenuiter pedicellatus pedicello 1.5–2 mm. longo, sepalis ovatis vel ovato-cordatis et basi interdum subauriculatis, apice obtusis vel saepe abrupte apiculatis. Corolla nunc absens vel abortiva (et stylus manifeste exsertus stigmate tenui circ. 0.4 mm. longo) nunc saepissime praesens, tubo sub 8 mm. longo et 1.7 mm. crasso, lobis ovatis vel ovato-cordatis sub 1.6 mm. longis. Fructus ignotus.

[1] Thus, *cf.* his "leaves . . . acuminate at both ends," a description fitting well *R. Forbesii*, whereas *R. sandwicensis* DC. was described as having *acute* leaves. Indeed, from Dr. Baehni's superb photograph (now before me) of the type of *R. sandwicensis*, the leaves are seen to have blades acute or subacute at their base *but subobtuse at their apex.*

Small tree, glabrous, bark smooth and yellowish, branches rigid and spreading. Similar in habit to *R. Forbesii*. Leaves verticillate, petiolate, the narrow petioles 1.5–3 cm. long; blade elliptic-oblong or narrowly oblong-obovate, acuminate or acute at both ends, 7–11 cm. long and 2–4 cm. wide. Inflorescence at first terminal finally lateral; peduncles angulate, slender, 1–3 or even to 6 cm. long, many-flowered. Bracts ovate-triangulate or lanceolate but at apex as a rule sharply and more or less abruptly acuminate, commonly 1–2 mm. long. Calyx 2–3 mm. long, manifestly and often slenderly pedicellate with a pedicel 1.5–2 mm. long, sepals ovate or ovate-cordate and at base sometimes subauriculate, at apex obtuse or often abruptly apiculate. Corolla now lacking or abortive (and style manifestly exserted, its stigma slender and about 0.4 mm. long) now very often well developed, its tube under 8 mm. long and 1.7 mm. thick, its lobes ovate or ovate-cordate and under 1.6 mm. long. Fruit unknown.

Specimens examined: *Amos Arthur Heller* 2582, on the ridge west of the Hanapepe River, Isl. Kauai, July 17, 1895 (type, N.Y.: isotypes, Chi.; Gray; N.Y.; Par.).

7. **Rauvolfia mauiensis** sp. nov.

Frutex forsitan rarius subarborescens, suco lacteo, internodiis saepissime 3–9 mm. longis. Folia verticillata, nodum quodque 5, petiolata petiolis tenuibus 1.5–3 cm. longis, axilla quaque 5–12 stipitatos glandulos subtendente; laminis elliptico-oblongis, apice saepius subobtusis, basi acutis vel acuminatis, membranaceis, glabris, 6–8 (rarius –10) cm. longis et 1.5–3 cm. latis. Flores (ex inflorescentibus veteribus sine dubio subnumerosi) non visi. Inflorescentia 4-partita, primum terminalis demum lateralis, 4 pedunculis circ. 1.5–3 cm. longis, glabris, pedicellis demum 3–4 mm. longis. Fructus demum ±1.8 cm. lati et ±1.3 cm. alti, glabri, in herbario nigri.

Shrub or perhaps rather rarely subarborescent; sap milky, internodes most often 3–9 mm. long. Leaves whorled, 5 to each node, petiolate (petioles slender, 1.5–3 cm. long), each axil subtending 5–12 stipitate glands; blades elliptic-oblong, at apex more often subobtuse, at base acute or acuminate, membranaceous, glabrous, 6–8 (more rarely –10) cm. long and 1.5–3 cm. wide. Florets (without doubt numerous as seen from the old inflorescences) not observed. Inflorescence 4-parted, at first terminal but finally lateral, the 4 peduncles about 1.5–3 cm. long, glabrous, the pedicels finally 3–4 mm. long. Fruits finally ±1.8 cm. wide and ±1.3 cm. tall, glabrous, in the herbarium black.

Specimens examined: *Joseph F. Rock* 8660, lava fields along the government road, Kahikinui, East Maui, November, 1910 (type, Gray: isotypes, N.Y.; Par.).

At once distinguished from the other Hawaiian species of *Rauvolfia* by its characteristic elliptic-oblong leaf-blades. This is the species pictured by Rock (Indigenous Trees of the Hawaiian Islands 408, pl. 166. 1913, excluding the misapplied name *R. sandwicensis* A. DC.). Rock speaks of plants "growing on the rough *aa* lava flows on the leeward sides of the Hawaiian Islands, as on Auahi, Maui, on the southern slopes of Mt. Haleakala," where, he says, "it is a more or less stunted shrub." It may be noted here that the "Auahi" (Auwahi) mentioned by him in his Indigenous Trees is in the southwestern part of the District of Kahikinui referred to by him on the type label of *R. mauiensis*.

ADDITIONS TO THE GENERA SCALESIA ARN. AND HIDALGOA LLAVE AND LEX.

(FAMILY COMPOSITAE)

EARL EDWARD SHERFF

Scalesia Menziesii Degener & Sherff comb. nov. *Zemisne Menziesii* Deg. & Sherff *ex* Sherff, Amer. Journ. Bot. 22: 708, pl. 1. 1935.

Stated on type sheet to have been collected by Menzies, on the Vancouver Voyage, in the Hawaiian Islands. Whether this was true I cannot say, but the type is seen to be too close to the Galapagean *Scalesia* Arn. to permit retaining for it the monotypic genus *Zemisne*.

It is not impossible that the Menzies plant could have come from the Hawaiian Islands while the other species of *Scalesia* were endemic in the Galapagos Islands. The affinity, slight to be sure, between the floras of these two archipelagoes has already been noted elsewhere (*vide* Sherff, Amer. Journ. Bot. 32: 207. 1945). Still we have the possibility that, since the Vancouver Expedition visited both island groups, a confusion occurred as to habitat data,[1] and that Menzies really collected the plant on one of the Galapagos Islands.

The achenes on the Menzies plant were submature and originally construed as obcompressed. They should be reexamined to see if they are not better described as laterally compressed (as suspected by Dr. S. F. Blake some years ago, *in litt.*).[2] The leaves closely resemble those of *Scalesia aspera* Andersss. but are denser- and longer-hispid, and the branchlets are densely and conspicuously hispid (as seen in a type photograph of *S. Menziesii* before me, *Sherff* no. 2527),

[1] If *S. Menziesii* is to be sought for in the Galapagos group, it might be well to search especially on the northwest coast of Albemarle Island, since we read (Vancouver, Voy. 3: 381. 1798) that Menzies accompanied a Mr. Whidbey on a reconnoitering trip to that locality immediately after breakfast one morning early in February, 1795. They had been dispatched from their ship with orders to land somewhere to the southward of the western extremity of the land then in sight, which had been named Cape Berkeley, a small projection of land at the northwest tip of Albemarle Island. They returned "about five in the afternoon."

[2] Unfortunately, the Menzies type in some unaccountable way has become misplaced at the British Museum of Natural History, according to word kindly sent me by the Keeper of Botany at that institution, Dr. John Ramsbottom, and cannot be found at present.

not merely "scabrous with short scattered upwardly appressed hairs" (as stated by Howell, Proc. Calif. Acad. Sci. 4th ser., 22: 248. 1941 and as seen in *Stewart* 664 now before me). Moreover, *S. Menziesii* has its involucral bracts uni- or subbiseriate, while *S. aspera* has them in 2 to 4 series.[1]

Hidalgoa pentamera sp. nov.

Habitu *Hidalgoae ternatae* valde similis sed aliter satis diversa. Petioli tenues usque ad ±1 dm. longi; lamina membranaceissima plus minusve perfecte palmatimque 5-partita; stipulis deficientibus; foliolis rhomboideo-ovatis inferne cuneato-angustatis sed vix breviterve petiolulatis, grosse crenatimque pauci-serratis (dentibus mucronatis), apice obtusis rarius subacutis, punctulatis, non nisi secundum venas marginesque puberulis mediano usque ad 6.5 cm. longo et ad 4.5 cm. lato, aliis minoribus; axillis plerumque gemmam minimam abortivam tenuem subtendentibus. Capitula radiata, pansa ad anthesin tantum circ. 2–2.8 cm. lata et ±1.2 cm. alta; pedunculo tenui usque ad ±1.5 dm. longo. Involucrum moderate pubescens; bracteis exterioribus 3 vel 4, patentibus reflexisve, subulato-linearibus, apice acribus, 4–5 mm. longis; interioribus late ovato-oblongis, ±8 mm. longis et 4–5 mm. latis, erectis. Flores ligulati circ. 5; ligula (sicca) flava, oblonga vel latiore, apice bidentata, sub 1 cm. longa, stylo glabrato profunde bifurcato. Achaenia atra circumambitu elliptico-oblonga, perspicue subtiliterque longitudinali-strigosa, dorso longitudinaliter secundum medium valde turgida, ventre plana, corpore circ. 8 mm. longa et 4–5 mm. lata, apice saepius bicornuta cornibus robustis acribus plus minusve valde inflexis usque ad 3.5 mm. longis, demum paleas ovato-oblongas facile superantia. Flores disci flavi, tenues, limbo 5-dentati dentibus erectis; stylo flavo, hispidulo, simplici, saepe longe exserto.

Strongly similar in habit to *Hidalgoa ternata* but otherwise sufficiently different. Petioles slender, up to ±1 dm. long; stipules lacking; blade very thin-membranaceous, more or less perfectly and palmately 5-parted; leaflets rhomboid-ovate, cuneate-narrowed below but scarcely or shortly petiolulate, coarsely and crenately few-serrate (teeth mucronate), at apex obtuse or more rarely subacute, punctulate, not puberulous unless along veins and edges, the median one up to 6.5 cm. long and to 4.5 cm. wide, the others smaller; axils

[1] For the lending of valuable herbarium materials of *Scalesia*, I am greatly indebted to Dr. H. K. Svenson, until recently of the Brooklyn Botanic Garden, to Miss Alice Eastwood, Curator, and to Mr. John Thomas Howell, Assistant Curator, of the Department of Botany, California Academy of Sciences.

commonly subtending a very small abortive slender bud. Heads radiate, at anthesis only about 2–2.8 cm. wide and ±1.2 cm. tall; peduncle slender, up to ±1.5 dm. long. Involucre moderately pubescent; outer bracts 3 or 4, spreading or reflexed, subulate-linear, at apex sharp, 4–5 mm. long; inner ones broadly ovate-oblong, ±8 mm. long and 4–5 mm. wide, erect. Ligulate florets about 5; ligule (in dry state) yellow, oblong or broader, at apex bidentate, under 1 cm. long, the glabrate style deeply 2-branched; achenes black, in outline elliptic-oblong, conspicuously and delicately lengthwise-strigose, much swollen lengthwise along middle of dorsal surface, flat on ventral surface; body about 8 mm. long and 4–5 mm. wide, at apex more often 2-horned (horns robust, sharp, more or less strongly inflexed, up to 3.5 mm. long, at last easily surpassing the ovate-oblong paleae). Disk-florets yellow, slender, corolla-limb erectly 5-dentate; style yellow, hispidulous, simple, often long-exserted.

Specimens examined: *C. A. Purpus* 5897, Misantla, State of Veracruz, Mexico, August, 1912 (type, Chi.: isotype, N.Y.); *Sessé, Mociño, Castillo, & Maldonado* 3961, Mexico, 1787–1804 (Chi.).

At least ten good leaves still remain on the old *Sessé et al.* specimen, collected perhaps more than a century and a half ago. All have blades definitely 5-parted, in fact almost perfectly palmate. The original label bears the inscription, *Silphium pentaphyllum.* This name appears lacking in the published works of Sessé & Mociño, but indicates nevertheless that they had been impressed with the uniqueness of the foliage.[1]

Hidalgoa Steyermarkii sp. nov.

Habitu *Hidalgoae ternatae* similis sed foliis capitulisque minor. Caulis subtilis, acerrime sulculatus, prope nodos plus minusve hispidus setis pluriloculatis, internodiis brevibus sub 1 dm. longis. Folia estipulata, glabrata, petiolo tenui 2–4 cm. longo basi forsitan rarius

[1] They were familiar with the commoner *H. ternata,* having tripartite leaves, exemplified by two sheets of their material (Chi.) now before me. One is their no. 2918, labeled by them (on the duplicate at Madrid), "*Coreopsis triphylla.*" The other is their no. 3963, labeled by them (on the duplicate at Madrid), "*Sylphium trifoliatum.*" Thus their faith in the reliability of the leaf-character is indicated by their use of the names *triphylla* and *trifoliatum,* versus *pentaphylla.* Their faith seems indeed confirmed by the fact that the excellent specimens collected by Purpus more than a century later were likewise consistently 5-partite-leaved.

We may note here an additional name used by Sessé & Mociño (Fl. Mex. edit. 2. 195. 1894). This was their *Silphium ternatum* for a plant from the mountains of Tuxtla, in southern Mexico. I have not seen an authentic specimen, hence have omitted this published name from my synonymy.

torto; lamina ternata, foliolis petiolulatis, ovatis vel subrhomboideis, fere eciliatis, tantum 1–4 cm. longis et circ. 1–2.8 cm. latis, parce membranaceis, acriter serratis dentibus saepius 1–4 pro utroque latere. Capitula solitaria ad pedunculi tenuissimi 4–7 cm. longi apicem disposita, radiata, pansa ad anthesin ±4 cm. lata et ±1 cm. alta. Involucrum glabratum, bracteis exterioribus circ. 4 vel 5, lineari-lanceolatis vel ovato-deltoideis, apice acutis vel subacutis, circ. 4–5 mm. longis, demum interdum reflexis; interioribus oblongis, erectis, usque ad 7.5 mm. longis. Flores ligulati ±5, ligula aurantiaca lineari-oblonga usque ad 1.8 cm. longa apice acriter 2–4-dentata dentibus fimbriatulo-ciliatis; stylo glabrato profunde 2-ramoso. Flores tubulosi aurantiaci, corollae limbo 5-dentati, extus sparsissime hispiduli, stylo dense hispidulo saepissime simplici. Achaenia matura non visa.

Similar in habit to *Hidalgoa ternata* but with smaller leaves and heads. Stem slender, very sharply sulculate, more or less hispid near nodes with several-celled hairs, internodes short and under 1 dm. long. Leaves estipulate, glabrate, petiole slender and 2–4 cm. long, perhaps rather rarely coiled at base; blade ternate; leaflets petiolulate, ovate or subrhomboid, almost eciliate, only 1–4 cm. long and about 1–2.8 cm. wide, hardly membranaceous, sharply serrate with teeth more often 1–4 to each edge. Heads solitary at end of a very slender peduncle (this 4–7 cm. long), radiate, ±4 cm. wide at anthesis and ±1 cm. tall. Involucre glabrate, exterior bracts about 4 or 5, linear-lanceolate or ovate-deltoid, at apex acute or subacute, about 4–5 mm. long, sometimes finally reflexed; interior bracts oblong, erect, up to 7.5 mm. long. Ligulate florets ±5; ligule orange, linear-oblong, up to 1.8 cm. long, at apex sharply 2–4-dentate with fimbriatulous-ciliate teeth; style glabrate, deeply 2-branched. Tubular florets orange, 5-toothed at limb of corolla, outwardly very sparse-hispidulous, style densely hispidulous and very commonly simple. Mature achenes not seen.

Specimens examined: *Julian A. Steyermark* 48814, rays and disk orange, around lake southeast of Maxbal, about 17 miles north of Barillas, alt. 1,500 meters, Sierra de los Cuchumatanes, Dept. Huehuetenango, Guatemala, July 15–16, 1942 (type, Chi.).